

## Detailed Description Text - DETX (38):

The noise removing unit 56 performs smoothing on the color region signals of the image data using spatial filters in response to the instructions from the CPU 55. Image noise is reduced by performing moving average with weighting addition on the periphery pixels around the central pixel using two-dimensional smoothing filters. Thus, smooth images of high quality can be achieved.

## Detailed Description Text - DETX (42):

To the density converter 58, the image data of r, g, and b have also been inputted directly from the shading correction unit 52 prior to smoothing. The density converter 58 selects either the image data from the rgb converter 57 or the image data from the shading correction unit 52 in response to the instructions from the CPU 55, and converts them into density data.

## Detailed Description Text - DETX (43):

When the image data is judged to belong to a uniform density region according to the instructions from the CPU 55, the density converter 58 selects the image data outputted from the rgb converter 57 by an internal selector, and converts them into density data. When the image data is judged to belong to an edge portion, the density converter 58 selects the image data outputted

s Patent (15)

(11) Patent Number: 6,028,957

(45) Date of Patent: Feb. 22, 2000

G APPARATUS HAVING A  
CG UNIT

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JP

Co., Ltd., Osaka, Japan

5,345,320 6/1994 Hime 358-718  
5,397,393 10/1994 Hime 358-730  
5,504,134 3/1995 Hime 358-730  
5,553,725 10/1996 Schmid et al. 358-739  
5,680,590 11/1997 Shimizu et al. 362/254

Primary Examiner—Thomas D. Lee  
Assistant Examiner—Suzanne Britton  
Attorney, Agent, or Firm—McDermott, Will & Emery

(57) ABSTRACT

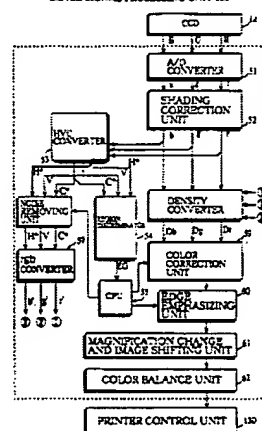
Pixel data comprising density data of R, G, and B obtained by reading an original with a CCD image sensor are subjected to shading correction by a shading correction unit, and then converted into color region signals H\*, V, and C\* to the Munsell color space by a first converter. According to the variations of V, a region discriminator determines whether each pixel data belongs to an edge portion of the original image or whether it belongs to a uniform density region of the original image. A noise removing unit performs noise removal by performing smoothing on color region signals H\*, V, and C\* of the pixel data which have been determined to belong to uniform density regions. A second converter converts the noise-removed color region signals into pixel data of R, G, and B.

IT DOCUMENTS

de et al. 358/164  
Suzuki et al. 358/443

16 Claims, 15 Drawing Sheets

## IMAGE SIGNAL PROCESSING UNIT 120



Details | Text | Image | HTML | KWIC

	U	1	Document ID	Issue Date	
2			US 5357353 A	19941018	Image for
3			US 6028957 A	20000222	Image for
4			US 5966222 A	19991012	Image for

US-PAT-NO: 5357353

DOCUMENT-IDENTIFIER: US 5357353 A

TITLE: Image forming apparatus

———— KWIC ————

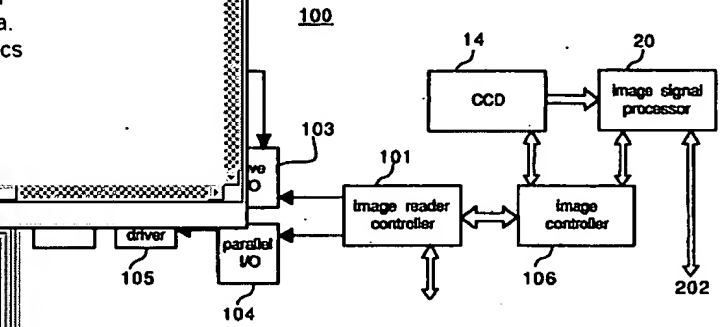
Detailed Description Text - DETX (59):

First, smoothing processing (method of moving averages with weighting) on the read data R, G and B of a central pixel under processing is performed in a local region including the pixel. Then, the levels of R, G and B are compared to decide if the color of the pixel is an achromatic color or not. Further, in order to improve the reproducibility of black, the parameters .alpha., .beta., are changed at four steps (refer to FIG. 11) according to the characteristics of the region after the smoothing processing, and the UCR/BP ratios are increased as the color becomes more achromatic.

Detailed Description Text - DETX (61):

Details: Text Image HTML KWIC

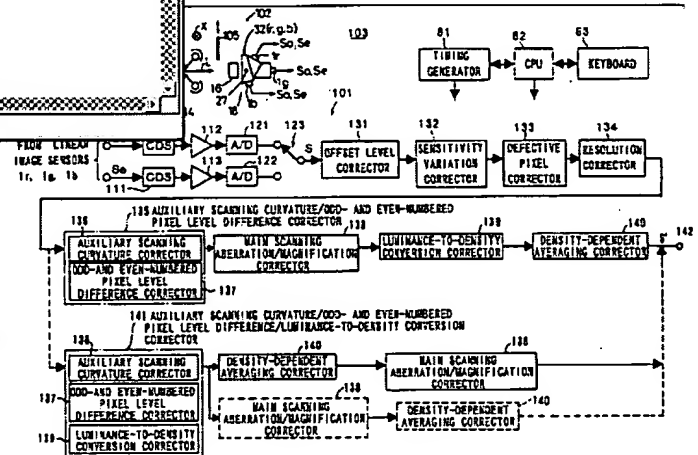
	U	1	Document ID	Issue Date	
1			US 20030144746 A1	20030731	Control for multidimensional
2			US 5357353 A	19941018	Image forming apparatus
3			US 20030109951 A1	20030612	Monitoring multidimensional



In view of the fact that the MTF of the human visual perception is high when the density of an image is high, when the density represented by the density dependent signal  $D_x$  is higher than a reference density level  $D_r$  inputted from a density input unit 281, i.e., when the density  $D=1.0$  or the corresponding luminance is lower than a reference luminance level  $D_r=1000$  (at this time, a binary signal  $G1$  from a comparator 277 goes high), and when the level of a contrast dependent signal  $C_x$  obtained as the difference between the preceding and following pixel signals  $S_p, S_a$  from a contrast calculating unit 276 is smaller than a reference contrast level  $C_r$  inputted from a contrast input unit 282 (at this time, a binary signal  $G2$  from a comparator 278 goes high), and when a correction on/off switch 283 is turned on to render a binary signal  $G3$  high, a switch control signal  $SE$  outputted from an AND gate 273 goes high. At

14 Claims, 11 Drawing Sheets

	U	1	Document ID	Issue Date	
7			US 6034794 A	20000307	Method of sensor
8			US 6170319 B1	20010109	Methods



## Detailed Description Text - DETX (38):

The histogram generation unit 35 determines the possibility that characters of a pattern are contact with each other based on the ratio of the width of a pattern to the width of an average character when characters are horizontally written; the ratio of the height of a pattern to the height of an average character when characters are vertically written; and the height-to-width ratio, etc. of the enclosing rectangle of a pattern. When it is determined that the pattern contains contact characters, the number of black picture elements is counted in the direction vertical to the character string, and a histogram of the number of black picture elements is generated after being smoothed using a moving average.

## Detailed Description Text - DETX (126):

In FIG. 12B, the histogram generation unit 35 obtains the histogram of the number of black picture elements by vertically scanning the patterns shown in FIG. 12A, and smooths it with a moving average, etc.

## Claims Text - CLTX (15):

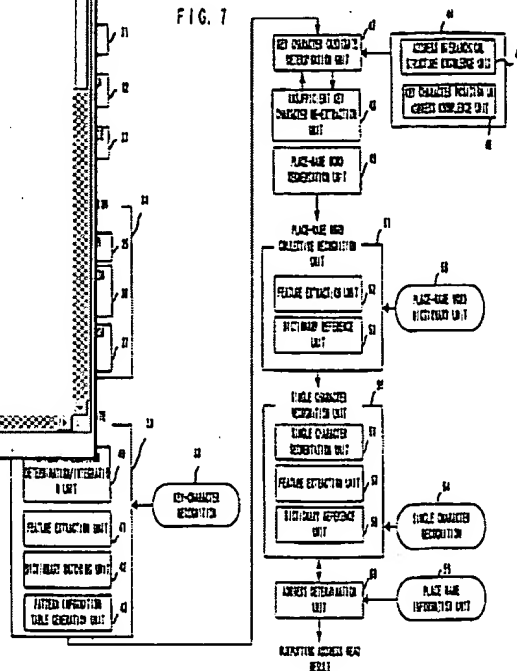
	U	1	Document ID	Issue Date	Address
1			US 6535619 B1	20030318	Address
2			JP 08129007 A	19960521	Analysis pre-burnt reacted g
3			JP 06164987 A	19940610	CLAMPIN

Mar. 18, 2003

Sheet 7 of 29

US 6,535,619 B1

FIG. 7



INT-CL (IPC): H04N005/18

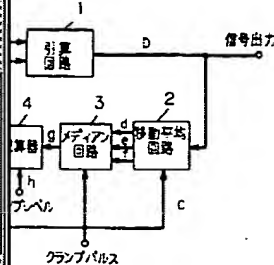
## ABSTRACT:

**PURPOSE:** To provide a clamping circuit capable of stably clamping a black level to a clamp level even for video signals in which pulse noise is mixed concerning the clamping circuit of the video signals.

**CONSTITUTION:** A moving average circuit 2 samples the output signals of a subtracting circuit 1 by clamp pulses for the prescribed period of time and converts the sampled signals to moving average values by plural moving average filters. A median circuit 3 converts the plural moving average values to a median value and a subtractor 4 subtracts the clamp level from the median value and outputs a control value. A memory circuit 5 holds the previous control value until such fine as sampling is performed by the next clamp pulse and the next control value is obtained, and then stably clamps the black level of the video signals to the clamp level.

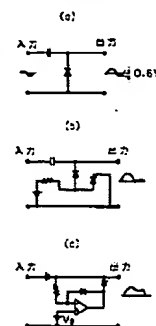
COPYRIGHT: (C)1994.JPO&amp;Japio

【図1】



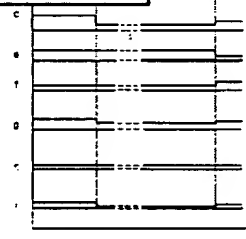
特開平6-164987

【図2】



Details Text Image HTML FULL

	U	-1	Document ID	Issue Date	
2			JP 08129007 A	19960521	Analysis pre-burnin reacted g
3			JP 06164987 A	19940610	CLAMPII
4			US 20020054395 A1	20020509	Color ima processir



DERWENT-ACC-NO: 1992-124771

DERWENT-WEEK: 199216

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TITLE: Document image reading appts. with improved shading correction - produces fresh reference data by smoothing in moving-average filter before application to shading correction circuit

INVENTOR: HIROTA, Y

PATENT-ASSIGNEE: MINOLTA CAMERA KK[MIOC]

PRIORITY-DATA: 1990JP-0262911 (September 28, 1990)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 4132548 A	April 9, 1992	N/A	013	N/A
DE 4132548 C2	December 8, 1994	N/A	013	H04N 001/38
JP 04138770 A	May 13, 1992	N/A	010	H04N 001/40

Details Text Image HTML FULL

	U	1	Document ID	Issue Date	
15			US 6617857 B1	20030909	DIS igniti
16			DE 4132548 A	19920409	Documen produces filter befo
17			US 20020091319 A1	20020711	Doppler u flow and

Patent (15) (11) Patent Number: 5,253,083  
(45) Date of Patent: Oct. 12, 1993

TO APPARATUS HAVING  
ADJUSTING CORRECTION  
Mits Hirota, Toyokawa, Japan  
In Camera Kikokusha Kisha,  
Japan

1, 1991

Initial Priority Data

Date: 3-24/91

H04N 1/40

H04N 1/46

H04N 1/47

H04N 1/48

H04N 1/49

H04N 1/50

H04N 1/51

H04N 1/52

H04N 1/53

H04N 1/54

H04N 1/55

H04N 1/56

H04N 1/57

H04N 1/60

H04N 1/61

H04N 1/62

H04N 1/63

H04N 1/64

H04N 1/65

H04N 1/66

H04N 1/67

H04N 1/68

H04N 1/69

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H04N 1/71

H04N 1/72

H04N 1/73

H04N 1/74

H04N 1/75

H04N 1/76

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H04N 1/98

H04N 1/99

H04N 2/00

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H04N 2/15

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H04N 2/29

H04N 2/30

H04N 2/31

H04N 2/32

H04N 2/33

H04N 2/34

H04N 2/35

## FOREIGN PATENT DOCUMENTS

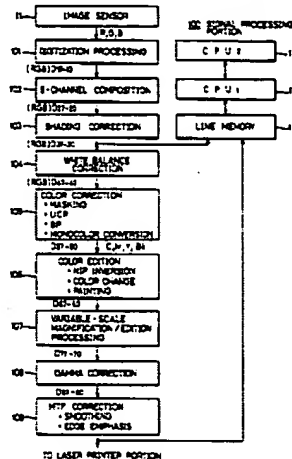
142119 11/1984 Fed. Rep. of Germany  
071177 11/1983 Japan  
3-2141 1/1990 Japan

Primary Examiner—Edward L. Cole, Sr.  
Assistant Examiner—Jerome Grant, II  
Attorney, Agent or Firm—Stutz, Dorn, Swecker & Martin

## ABSTRACT

An image reading apparatus according to the present invention includes an image reading apparatus including a plurality of image reading elements, a reference image reading apparatus for reading a reference image by using the image reading apparatus; a smoothing apparatus for smoothing reference image data read by the reference image reading apparatus; an original image reading apparatus for reading an original image by using the image reading apparatus; and an original data correcting apparatus for correcting original data read by the original image reading apparatus on the basis of the smoothed reference image data.

3 Claims, 7 Drawing Sheets



#### Detailed Description Text - DETX (74):

The results from the in vitro studies provided motivation for conducting an in vivo study. The electronic system was used to collect autofluorescence images from colonic adenomas in vivo. In this system, an SNR of over 30 was attained as well, which exceeded the minimum SNR requirement of 4. Fluorescence images were collected from 14 adenomas and 6 hyperplastic polyps from 30 patients undergoing routine colonoscopy. The fluorescence images were collected in a 33 ms frames, and were processed by dividing the raw fluorescence image with a moving average image. The processed images displayed regions of mucosa with a probability of containing dysplasia in the form of adenomas, as verified on histology. With the threshold set to 75% of the average normal intensity, a sensitivity of 86% was achieved for detecting adenomas and a specificity of 100% was attained for hyperplastics. On average, the ratio between the fluorescence intensity of normal mucosa to that from adenomas was  $2.0 \pm 0.6$  and to that from hyperplastic polyps was  $1.1 \pm 0.2$ . The diseased regions on fluorescence best corresponded to the adenoma on white light when the colonoscope was at normal incidence. At higher angles there were greater effects from shadows. These results showed that dysplasia can be identified on fluorescence images in vivo.

Mar. 25, 2003

Sheet 2 of 12

US 6,537,211 B1

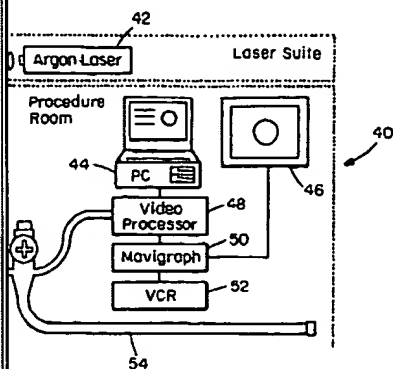


FIG. 3

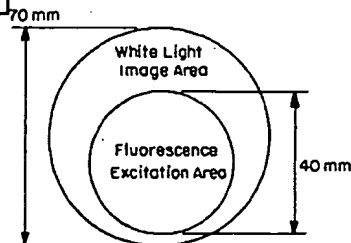


FIG. 4

	U	1	Document ID	Issue Date	
24			US 20030120365 A1	20030626	Flicker co
25			US 6537211 B1	20030325	Fluoresce
26			US 20030191368 A1	20031009	Fluoresce

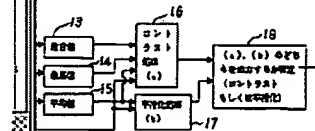
the density value of an attentional pixel converted so as to increase the difference of gradation rather than the attentional pixel of an image.

**SOLUTION:** A contrast processing circuit 16 compares the attentional pixel of a source image with a mean value, and when the density of the attentional pixel is close to the mean value and is white rather than a certain determined value, the level is changed by converting the pixel to white. Then, a maximum black value, a maximum white value, a mean value and the density value of the attentional pixel are detected from the information of respective pixels in a prescribed mask inside the image, the mean value is found from the information of density around or near the attentional pixel by a moving average method, and when the density of the attentional pixel is close to the mean value and the result of the mean value is close to white, the attentional pixel is changed into white pixel, but when the result of the mean value is close to black, the attentional pixel is changed into black pixel. Next, when the gradation of respective pixels in the mask is remarkably dispersed, the difference of gradation is widened in the mask, density converting processing is performed and the density value of the attentional pixel, which is converted to enlarge the difference of gradation rather than the attentional pixel of the image, is extracted.

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- (3) 特開2000-222568  
8
- 【符号の説明】
- 11 原画像
  - 12 マスク処理回路
  - 13 最大値検出回路
  - 14 最小値検出回路
  - 15 平均値検出回路
  - 16 コントラスト処理回路
  - 17 平滑化処理回路
  - 18 特定処理
- ントラスト強調処理の構成  
ントラスト強調処理の作用  
ントラスト強調処理の構成  
ントラスト強調処理の作用

【図1】



【図2】

$$1 \times 0.5 + 1.5 \times 0.5 + 2.5 \times 0.5 + 3.5 \times 0.5 + 4.5 \times 0.5 = 2.5$$

平均値 (平均値)

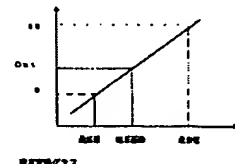
1.5以下の密度値を0.5に固定処理を行う (7)

【図4】

1.5 2.5 3.5  
1.5 1.5 2.5  
1.5 1.5 1.5

1.5 = 0.5 + 1.5 + 2.5 + 3.5 + 4.5 = 11.0  
11.0 / 7 = 1.57 (四捨五入)  
1.57を1.5に丸めると  
1.5 = 0.5 × (1.5 - 0.5) + (0.5 - 0.5) × 0.5  
0.5 - 0.5 = 0 ... 処理済みの密度値が0.5に固定された  
1.5以下の密度値を0.5に固定処理を行う。  
マスク内で検出された最大値と最小値 (コントラスト) 強調処理

【図3】



	U	1	Document ID	Issue Date	
27			US 4541633 A	19850917	Game wit
28			JP 2000222568 A	20000811	IMAGE C CONTRA
29			US 5357353 A	19941018	Image for



## Detailed Description Text - DETX (26):

The correcting means 409 repeats the above procedure with all of the one line of density data. Subsequently, the correcting means 409 searches for a white peak (Dwp) and a black peak (Dbp) in the one line of density data subjected to the above moving average processing, while sequentially updating their positions (steps 2-c through 2-g).

## Detailed Description Text - DETX (29):

The correcting means 409 compares with the adaptive threshold L.sub.th the one line of density data subjected to the moving average processing between the pixels where the white pixel (Dwp) and black peak (Dbp) respectively appeared. As shown in FIG. 18, the correcting means 409 determines the address A1 of the first one of seven consecutive pixels over which density data above the adaptive threshold L.sub.th continuously appear (step 2-i). In FIG. 18, ibp and iwp respectively indicate a black peak position and a white peak position. That is, the correcting means 409 selects, as the threshold L.sub.th, a medium value dividing the range between the white peak (Dwp) and the black peak (Dbp) in a ratio of 1:2, and determines a portion where the following six consecutive pixels are above the threshold L.sub.th to be a boundary. As shown in FIG. 19, the correcting means 409 executes linear interpolation with the density data of

Dec. 11, 2001

Sheet 13 of 49

US 6,330,050 B1

Fig. 18

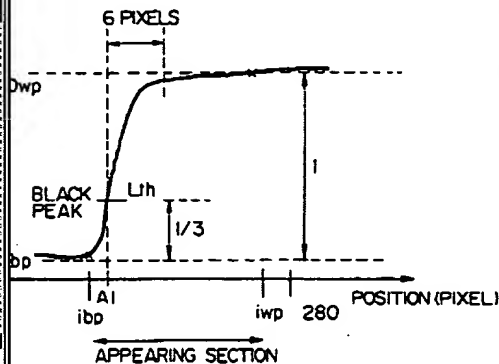
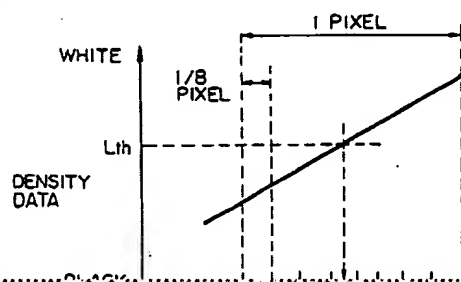


Fig. 19

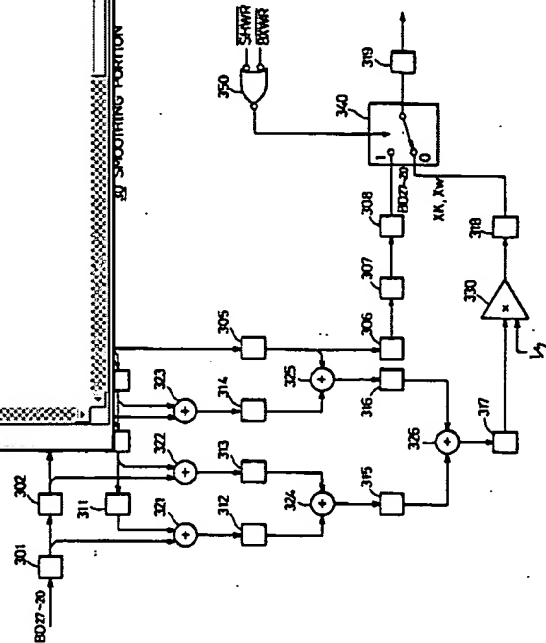


	U	1	Document ID	Issue Date	
29			US 5357353 A	19941018	Image for
30			US 6330050 B1	20011211	Image pre distortion
31			JP 2003125177 A	20030425	IMAGE R

**5,253,083**

———— KWIC ————

According to the foregoing embodiment, since the number of object levels for



	U	1	Document ID	Issue Date	
32	<input type="checkbox"/>	<input type="checkbox"/>	JP 2003125177 A	20030425	Image re: correction calculated block of w
33	<input type="checkbox"/>	<input type="checkbox"/>	US 5253083 A	19931012	Image re:
34	<input type="checkbox"/>	<input type="checkbox"/>	US 5870142 A	19990209	Image se

KWIC

## Detailed Description Text - DETX (36):

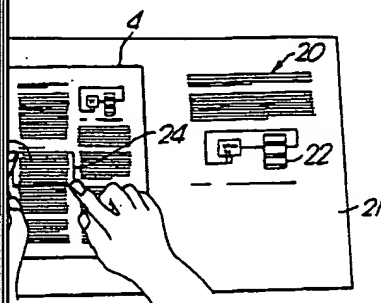
In order to make a good one-bit-per-pixel image of a black and white document, the system must use an adaptive thresholding algorithm which varies the threshold value across the image according to its background value at each pixel. Some adaptive thresholding algorithms (e.g. R. J. Wall, "The Gray Level Histogram for Threshold Boundary Determination in Image Processing with Applications to the Scene Segmentation Problem in Human Chromosome Analysis", Ph.D. dissertation, UCLA, 1974) produce very good results but require more than one pass through the image, and have been found to be too slow to support user interaction. It is possible to get nearly as good a result in a single pass, however, by calculating the threshold value at each point from an estimate of the background illumination based on a moving average of local pixel intensities; specifically the local pixels contained within about 1/8th the width of the image. This method is much faster and can also be combined with a scaling operation if necessary.

Apr. 23, 1996

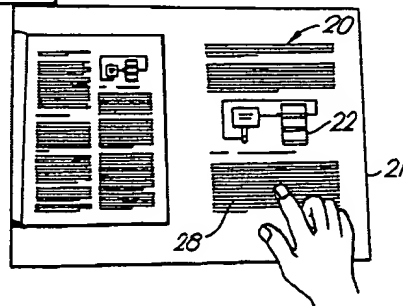
Sheet 6 of 21

5,511,148

6e



6f



	U	1	Document ID	Issue Date	
35			US 20020054374 A1	20020509	Image-re: obtaining from a re
36			US 5511148 A	19960423	Interactiv
37			US 6108321 A	20000822	Interferer

## ABSTRACT:

**PURPOSE:** To obtain the line detector which decreases the amount of binary processing data, can detect lines at high speed and is hardly affected by pitching or the like.

**CONSTITUTION:** The white line is detected by processing an image obtained by a CCD camera 10 and in this case, the white line is detected by executing the black-and-white binarizing of image signals. Only concerning the image signals in a prescribed range, however, this binarizing processing is executed. In order to decide this processing range, a position moving and averaging plural white line detecting positions in the past is calculated each time and based on this position, the white line position in the next time is estimated. Then, a prescribed range near the white line position estimated from the image data obtained by the CCD camera 10 is defined as the processing range.

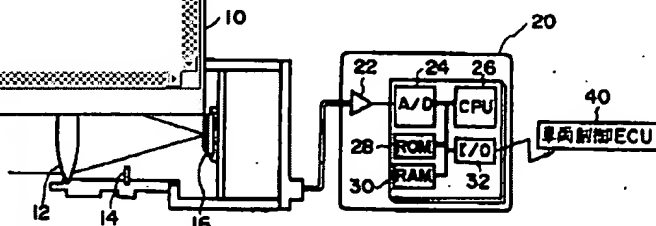
COPYRIGHT: (C)1992,JPO&Japio

	U	1	Document ID	Issue Date	
38			US 5811779 A	19980922	Laser bar nuclear re
39			JP 04299799 A	19921022	LINE DE
40			US 6314131 B1	20011106	Method a averaged

のため、処理対象  
高速化を図ることが  
γMの自動運転を適  
置の一実施例を示す  
検出を説明するため  
該動作を説明するた  
フローチャートであ  
動作を示すフローチ  
動作を示すフローチ  
フローチャートであ

【図8】白線検出出力、白線位置予測の動作を示すフロ  
ーチャートである。  
【図9】白線検出出力、白線位置予測の動作を示すフロ  
ーチャートである。  
【図10】白線検出出力、白線位置予測の動作を示すフロ  
ーチャートである。  
【図11】白線位置予測の手法を示す説明図である。  
【図12】白線位置予測の動作を示すフローチャートであ  
る。  
【図13】エラー処理の動作を示すフローチャートであ  
る。  
【図14】CCD中心有線方の動作を示すフローチャ  
ートである。  
【符号の説明】  
10 CCDカメラ  
20 白線検出ECU  
24 AD変換部  
26 CPU

【図1】



実施例の構成

10: CCD カメラ  
16: CCD リニアセンサ  
20: 白線検出 ECU

[45] Date of Patent: Jul. 20, 1999

### USING DITHERING THRESHOLD

Primary Examiner—Thomas D. Lee  
Attorney, Agent, or Firm—Brinks Hofer Gilson & Lyons

12. Ålgårde, Denmark

[57] ABSTRACT

## Abstract

... G06K 9/36; G06K 9/46  
A82/237; 382/270; 358/455;  
358/464; 358/466  
----- 382/237, 270;  
5, 457, 458, 459, 466, 474,  
464, 465, 466

A method and apparatus of preparing the reproduction of a document based on scanning the original including generating a signal representing gray tone values for points along lines across the scanned original and providing a set of threshold values for said points. The set of threshold values being determined so that gray tone values in a uniform area on the original are converted into a uniform black or white representation in a first one-bit representation. The method and apparatus provides parameter values for said points in a dither circuit, and converts the gray tone signal received from the line scanning unit into a signal comprising a second one-bit representation. The conversion into a one-bit representation is performed by depending on the individual gray tone values compared with the present threshold values and the dither circuit output for the points in question.

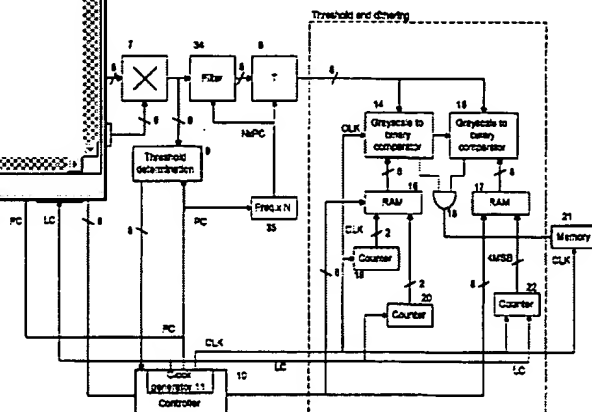
Cited

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**36 Claims, 8 Drawing Sheets**

	U	1	Document ID	Issue Date	
52			US 5548110 A	19960820	Optical er processin such as c
53			US 5926570 A	19990720	Optical so
54			US 20040008247 A1	20040115	Optical w apparatus

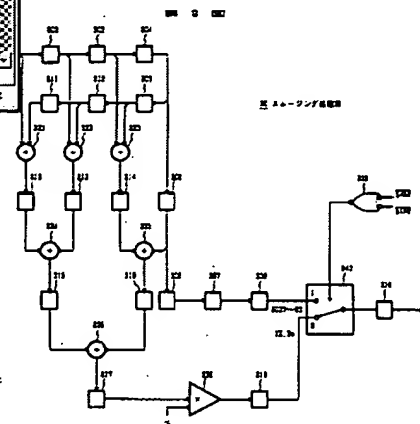
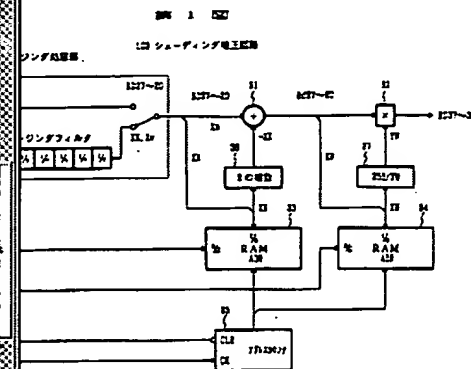


PORT 00E: To reduce the influence of external noises against the picture quality by generating reference picture data while performing a smoothing processing against the picture data reading the reference picture and correcting the picture data reading an original picture based on the reference picture data.

CONSTITUTION: When power source is supplied to an image reader part IR, at first, an image sensor 11 is driven in a state turning off an exposing lamp 17 to obtain reference data XK with black label, and picture data BD27 to 20 with black label are inputted to a smoothing processing part 30. The smoothing processing part 30 performs the smoothing processing performing, so to speak, moving average against the picture data BD27 to 20. In short, the processing replacing the values of picture data BD27 to 20 for noted picture element (noted picture element) to the average value of the picture data BD27 to 20 for seven picture elements totaling the noted picture element and the six picture elements on both sides (three for each side) against respective picture data BD27 to 20 for each picture element to be successively inputted according to a clock signal SYNCK.

COPYRIGHT: (C)1992,JPO&Japio

図 4-138770 (8)



- 416 -

	U	1	Document ID	Issue Date	
62			US 6704093 B2	20040309	Scanning device m
63			JP 04138770 A	19920513	SHADING
64			JP 10009840 A	19980116	SURFAC

US-PAT-NO: 5873959

DOCUMENT-IDENTIFIER: US 5873959 A

TITLE: Adaptive control for reheat furnace

KWIC

## Detailed Description Text - DETX (10):

The weighted, moving average is calculated so that the most recent slab values have the greatest effect on the weighted average. While using a weighted, moving average is preferred, applications of this invention may exist wherein a simple moving average will suffice.



US005873959A

s Patent (15)

(11) Patent Number: 5,873,959

(45) Date of Patent: Feb. 23, 1999

## TROL FOR REHEAT

J. Schurke, Pittsburgh; Frank  
and, Allquippa, both of Pa.  
Technologies Inc., Coraopolis.

## OTHER PUBLICATIONS

"Automatic slab heating control at Inland's 60-in. hot strip  
mill", Timothy A. Walbeck et al., AISE Year Book, Dec.  
1986, pp. 577-584.

Primary Examiner—Scott Kessler  
Attorney, Agent, or Firm—Webb Zischstein Branning  
Logsdon Orth & Hanson, P.C.

(37)

## ABSTRACT

A method of controlling a reheat furnace to deliver pieces at  
an aim discharge temperature comprises the steps of deter-  
mining the ratio between calculated reheat furnace discharge  
temperatures and measured temperatures of pieces in a  
rolling mill receiving the output of the reheat furnace,  
filtering this ratio based upon time in the rolling mill to  
provide the current filtered relationship between calculated  
discharge temperatures and said measured temperatures to  
provide filtered ratios, comparing desired temperatures in  
the rolling mill with said measured temperatures of pieces in  
the rolling mill to establish error values, filtering the error  
values based upon time in the mill to provide filtered error  
values, and processing the filtered error values and the  
filtered ratios to establish a short-term bias to the aim exact  
temperature.

1993

## Application Data

a. 742,770, Aug. 9, 1991, abandoned.

CZ1D 1/34

148,511; 266,657

148,511; 266,657

## Process Claim

## T DOCUMENTS

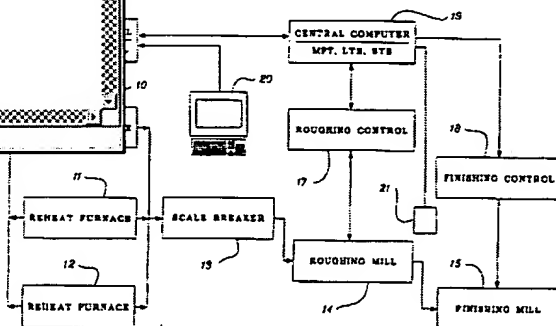
via 266,657

sch 148,511

17 Claims, 3 Drawing Sheets

Details | Text | Image | HTML | KWIC

	U	1	Document ID	Issue Date	
1			US 5873959 A	19990223	Adaptive
2			US 4989165 A	19910129	Apparatu
3			US 5249484 A	19931005	Apparatu based on









KWIC

Sep. 1, 1993

Sheet 3 of 6

5,144,688

## Detailed Description Text - DETX (33):

At very high compression ratios, the predominant distortion that occurs in the present invention are block effects arising from coarse quantization of the average intensities in uniform (non-edge) blocks. Block effects are manifested as visual false contours occurring between blocks of similar average gray level. To correct this problem, simple block smoothing algorithms may be applied to the mean block intensity, without degrading the image details (edges). An efficient smoothing technique is to apply a smoothing filter to the mean intensity before the edges are superimposed. It is found that a simple 3.times.1 moving average filter applied along each dimension of the mean intensity subimage prior to adding the edge block, decreases the visual distortion. The moving average filter is simply the weighted average of three adjacent points. TABLE I shows the computation complexity of a 4.times.4 decoding and smoothing operation when both equal weight and nonequal weights are used:

$$\begin{aligned}
 5a \quad & \begin{pmatrix} p_1 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_2 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_3 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \\
 5b \quad & \begin{pmatrix} p_4 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_5 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_6 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_7 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \\
 5c \quad & \begin{pmatrix} p_8 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_9 \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_{10} \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \\
 5d \quad & \begin{pmatrix} p_{11} \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_{12} \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_{13} \\ \cdot \\ \cdot \\ \cdot \end{pmatrix} \begin{pmatrix} p_{14} \\ \cdot \\ \cdot \\ \cdot \end{pmatrix}
 \end{aligned}$$

	I	II
MAG. MIN.	30	10
MAG. MAX.	30	90

	I	II
BLOCK TYPE	UNIFORM	EDGE
BLOCK TYPE INDICATOR	1	1
MEAN INTENSITY	5	3
PATTERN INDEX	2	3
GRADIENT INDEX		3
POLARITY INDICATOR	1	1
TOTAL BITS	$\pi_{11} = 6$	$\pi_{12} = 7$
TOTAL BPP	$(0.375, 0.4375)$	$(0.4375, 0.75)$
COMPRESSION RATIOS	$(18.29, 21.33)$	$(10.67, 18.29)$

Fig. 6

	U	1	Document ID	Issue Date	Method a
36			US 5549655 A	19960827	sleep apr
37			US 5144688 A	19920901	Method a
38			US 5414619 A	19950509	Method a

**ABSTRACT:**

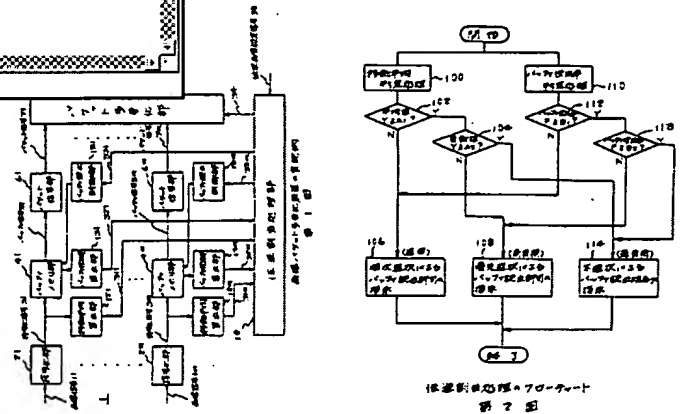
**CONSTITUTION:** Moving average calculation sections 121-12n apply weight average calculation to a time series data of a picture coded signal by a weight function to obtain a moving average Y. Then threshold levels A1, A2 of the moving average Y are provided to set a normal area, a high load area and an overload area. A transmission assignment processing section 10 applies packet processing to a signal at a terminal equipment when the moving average Y enters the overload area with priority. When the moving average Y enters the high load area, the packet processing is stopped. When the moving average is a history for processing period, it represents prediction that the tendency at a current point of time will continue for a while. Thus, the capacity excess of an exchange network is prevented in advance.

Details Text Image HTML FULL

	U	1	Document ID	Issue Date	
41			US 5682329 A	19971028	On-line m
42			JP 04013390 A	19920117	PICTURE
43			US 5198771 A	19930330	Potential

同音による假名遣と、パツ	19. . . . . 仮定知能の高直書。
仮名遣による異音同パツ	21-22. . . . . 符号色紙
海軍省による公文書の多量	41-42. . . . . パツファツナツナ。
海軍省の海軍文書のバ	61-62. . . . . パツナツ成立。
平仮名とすることによる	121-122. . . . . 移動平仮名直書。
鳥羽詩苑および雑誌のバシ	131-132. . . . . パツファツ使用平仮名直書。
仮定知能を同じうにせし	141-142. . . . . パツファツ使用直書。

神奈バット多量化協会  
代表者人 神電工労働組合  
による活動と神奈バ  
ットのフロア、  
その事業所、  
その部、  
その製造の部、  
部とその製造の部、  
を系する区である。  
**その展開**  
バット多量化協会



US-PAT-NO: 5982790

DOCUMENT-IDENTIFIER: US 5982790 A

TITLE: System for reducing pulse-to-pulse energy variation in a pulsed laser

KWIC

## Brief Summary Text - BSTX (29):

According to the method of the invention, mean pulse magnitude  $[M]$  is calculated from pulse magnitudes  $M_{\text{sub}.i}$ . This can be done by using all of the past magnitudes  $M_{\text{sub}.i}$  or a sample containing a number  $q$  of laser pulses  $i$ , where  $q \geq 1$ . Consequently, mean  $[M]$  can be a weighted average or a moving average.



US005982790A

s Patent (5)

(11) Patent Number: 5,982,790

(45) Date of Patent: Nov. 9, 1999

REDUCING PULSE-TO-PULSE  
VARIATION IN A PULSED LASERMark Grossman, Los Alamos,  
N.M.; and  
John Doherty, San Jose, Calif.ve Electronics Corporation,  
San Jose, Calif.

48

1997

H01S 3/10

372/25, 372/64, 372/38,

372/10, 372/30

372/25, 38, 65,

372/10, 25, 30

References Cited

U.S. PATENT DOCUMENTS

Grossman et al. 372/30

Doherty 372/29

Grossman et al. 372/30

Doherty 372/25

5,330,323 6/1994 Rouse et al. 372/25

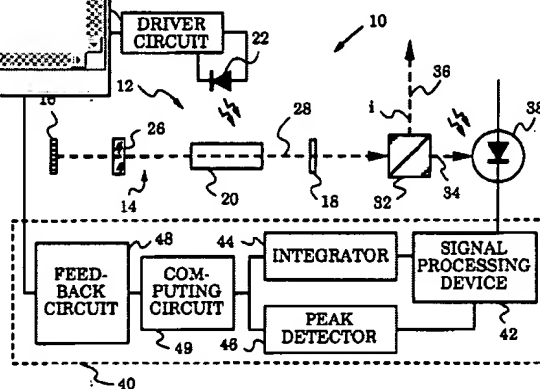
5,365,532 11/1994 Klare et al. 372/31

Primary Examiner—Lisa Scott, Jr.  
Attorney, Agent, or Firm—Littman Intellectual Property  
Services

(57) ABSTRACT

A system and method for reducing pulse-to-pulse energy and peak power variation in various types of pulsed lasers, and in Q-switched lasers in particular. The system of invention has a laser cavity with a lasing medium pumped by a pumping device for delivering to the medium a pumping energy  $E_{\text{pump}}$ . The system further includes a detection device and circuitry for determining the pulse magnitudes  $M_i$  of laser pulses  $i$ , such as peak pulse amplitudes  $A_i$ , pulse energies  $E_i$ , pulse widths  $W_i$ , or other pulse metrics. According to the method of invention, a feedback mechanism which is in communication with the pumping device ensures pulse-to-pulse stability by increasing the pumping energy  $E_{\text{pump}}$  when pulse magnitude  $M_i$  of laser pulse  $i$  exceeds a mean pulse magnitude  $[M]$  and decreasing the pumping energy  $E_{\text{pump}}$  when  $M_i$  is less than  $[M]$ . Alternatively, the feedback mechanism is in communication with the switching device which controls the variable loss factor of the Q-switch. Pulse-to-pulse peak and energy stability is achieved by decreasing the variable loss factor when  $M_i$  of pulse  $i$  exceeds the mean  $[M]$  and increasing the variable loss factor when  $M_i$  of laser pulse  $i$  is less than  $[M]$ .

46 Claims, 5 Drawing Sheets



	U	1	Document ID	Issue Date	
59			US 5103401 A	19920407	System for feeder sy
60			US 5982790 A	19991109	System for laser
61			JP 08168489 A	19960702	ULTRAS

US06459387B1

**ates Patent** (10) Patent No.: US 6,459,387 B1  
(45) Date of Patent: Oct. 1, 2002

ING APPARATUS	0,015,237 A *	1/2000 Otsu	362/460
	0,254,237 B1 *	7/2001 Kobayashi	362/463
obayashi Kazuhito Sumit	0,253,040 B1 *	9/2001 Hayashi et al.	362/465

Mitsubishi Denki Kasei, Ltd. (JP)		FOREIGN PATENT DOCUMENTS	
05	2 337 578	11/1969	B60Q1/74

**Primary Examiner—John Tweed**  
(T4) Attorney, Agent, or Firm—Gregory Miron, PLLC

(57) **ABSTRACT**  
A vehicle lighting apparatus is provided with a travel

2000  
Classification Priority Data

11-293625  
G08G 1/123

340-968; 362-37; 362-460;  
362-465  
340-968; 362-37,  
367-459 460 465 478 484

302, 337, 401, 403, 424, 460

sources cited

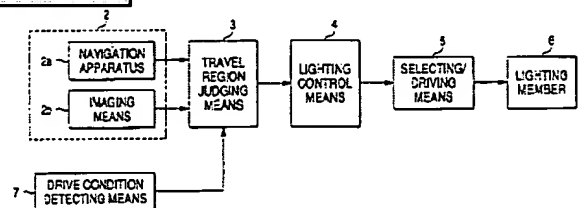
IT DOCUMENTS

66	Oorou	362.37
67	Ootoni	362.37
68	Oorou	362.37

20 Claims, 24 Drawing Sheets

**20 Claims, 24 Drawing Sheets**

	U	1	Document ID	Issue Date	
63	<input type="checkbox"/>	<input type="checkbox"/>	US 5895435 A	19990420	Vehicle d apparatus force con
64	<input type="checkbox"/>	<input type="checkbox"/>	US 6459387 B1	20021001	Vehicle li
65	<input type="checkbox"/>	<input type="checkbox"/>	US 6445761 B1	20020903	X-ray cor irradiator



DOCUMENT-IDENTIFIER: US 5442462 A

TITLE: Apparatus and method for smoothing images

KWIC

Current US Original Classification - CCOR (1):

358/463

Other Reference Publication - OREF (21):

"Moving Average To Decrease Noise", Real Time Video Image Processing, Quantex Corporation.

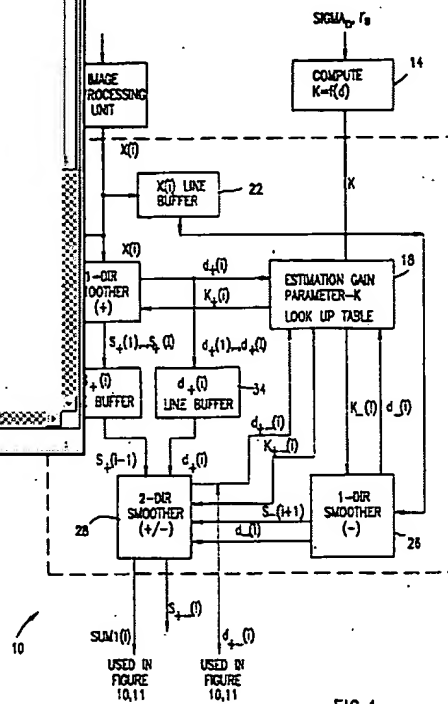
Aug. 15, 1995

Sheet 1 of 10

5,442,462

Details: Text Image HTML KWIC

	U	1	Document ID	Issue Date	
1			US 5442462 A	19950815	Apparatus
2			US 6633684 B1	20031014	Distortion
3			US 5901243 A	19990504	Dynamic



KWIC

## Detailed Description Text - DETX (28):

Smoothing portion 30 subjects image data BD27 - 20 to a smoothing processing which is a so-called moving average processing. More specifically, smoothing portion 30 replaces the value of image data BD27 - 20 of a subject pixel with the average value of image data BD27 - 20 of seven pixels in total combining the subject pixel and six pixels in opposite sides of the subject pixel (three pixels for each side), with respect to image data BD27 - 20 of each of the pixels that are sequentially input in accordance with clock signal SYNCK.

## Detailed Description Text - DETX (45):

Thus, shading correction circuit 103a includes a smoothing portion 40 for carrying out a moving average processing by separating the pixels into odd number pixels and even number pixels. Shading correction circuit 103a carries out a correction of a black level on the basis of reference data XK1 corresponding to the odd number pixels and reference data XK2 corresponding to the even number pixels.

## Detailed Description Text - DETX (51):

	U	1	Document ID	Issue Date	
3			US 5901243 A	19990504	Dynamic
4			US 5253083 A	19931012	Image res
5			US 5926570 A	19990720	Optical so

s Patent (17)

 US05253083A  
 (11) Patent Number: 5,253,083  
 (45) Date of Patent: Oct. 12, 1993
TO APPARATUS HAVING  
ADJING CORRECTION
 Atsuo Hirota, Toyokawa, Japan  
 to Camera Kishida Kisha,  
 Japan

3, 1993

3, 1993

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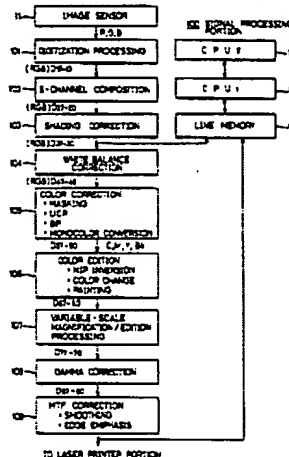
 J021375 11/1984 Pub. Rep. of Germany  
 021377 12/1983 Japan  
 3-1343 1/1990 Japan

 Primary Examiner—Edward L. Cole, Jr.  
 Andrew Examiner—Jerome Orsini, II  
 Attorney Agents or Firm—Banta, Dorn, Sweitzer &  
 Mach

## (57) ABSTRACT

An image reading apparatus according to the present invention includes an image reading apparatus including a plurality of image reading elements; a reference image reading apparatus for reading a reference image by using the image reading apparatus; a smoothing apparatus for smoothing reference image data read by the reference image reading apparatus; an original image reading apparatus for reading an original image by using the image reading apparatus; and an original data correcting apparatus for correcting original data read by the original image reading apparatus on the basis of the smoothed reference image data.

3 Claims, 7 Drawing Sheets



KWIC

## Detailed Description Text - DETX (5):

A threshold for the binary decision of a given pixel ("0" for black, "1" for white) should be set in such a way that if it belongs to the foreground of the scanned document, e.g. is significantly darker than other pixels in its neighborhood, it is called black. A technique useful for that purpose is called adaptive or dynamic thresholding and this technique is e.g. described in "Image Thresholding for Optical Character Recognition and Other Applications requiring Character Image Extraction" from IBM J. RES. DEVELOP. vol 27, no.4, 1983, by J. M. White and G. D. Rohrer. It should be noted that the terms "adaptive thresholding" and "adaptive thresholding circuit" are to be interpreted very broadly in the present application, covering the use of adaptive threshold techniques based on e.g. the moving average, area average, local average or statistical distribution of the grey tones represented in the scanned data. The threshold determination is performed on-line, i.e. the threshold values are updated simultaneously with data being scanned. A preferred way of doing so is described in the U.S. Pat. No. 5,377,020 assigned to the assignee of this case and hereby incorporated by reference.

Current U.S. Cross-Reference Classification - CCYP (2):

Details | Text | Image | HTML | KWIC

	U	1	Document ID	Issue Date	
4			US 5253083 A	19931012	Image re
5			US 5926570 A	19990720	Optical s
6			US 5777756 A	19980707	Video pro and redu

s Patent (5)

 (12) Patent Number: 5,926,570  
 (45) Date of Patent: Jul. 20, 1999

 THRESHOLD  
 THRESHOLD

Smith, Alagiris, Denmark

A/S, Denmark

84

1997

 G06K 9/36; G06K 9/46  
 382/237; 382/270; 358/455;  
 358/464; 358/466  
 382/237; 270;  
 358/456; 457; 458; 459; 468; 474;  
 464; 455; 466

Inventor: Chid

BY DOCUMENTS

 Systems et al. 358/459  
 358/460  
 358/474

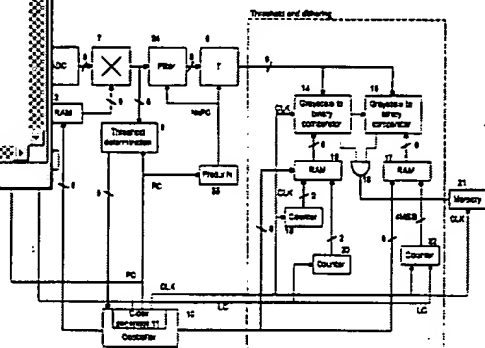
US005926570A

 Primary Examiner—Thomas D. Lee  
 Attorney, Agent, or Firm—Bridis Hoffa Gilson & Lione

(57) ABSTRACT

A method and apparatus of preparing the reproduction of a document based on scanning the original including generating a signal representing grey tone values for points along lines across the scanned original and providing a set of threshold values for said points. The set of threshold values being determined so that grey tone values in a uniform area on the original are converted into a uniform black or white representation in a first one-bit representation. The method and apparatus provides parameter values for said points in a dither circuit, and converts the grey tone signal received from the line scanning unit into a signal comprising a second one-bit representation. The conversion into a one-bit representation is performed by depending on the individual grey tone values compared with the present threshold values and the dither circuit output for the points in question.

36 Claims, 8 Drawing Sheets





**TITLE:** Video processing apparatus with multiple image signal integration and reduction for decreasing noise

KWIC

Current US Cross Reference Classification - CCXR (4):  
358/463

Other Reference Publication - OREF (2):

Gelb, A. ed. (1974) Applied Optical Estimation, Technical Staff, The Analytic Sciences Corporation, M.I.T. Press, Cambridge, Mass. "Moving Average to Decrease Noise", Real Time Video Image Processing, Quantex Corporation (no date given).



**Patent** (19) (11) Patent Number: **5,777,756**  
(45) Date of Patent: **Jul. 7, 1998**

**VIDEO APPARATUS WITH  
SIGNAL INTEGRATION  
FOR DECREASING  
NOISE**

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Application Date

54,213, Apr. 30, 1993, abandoned

Non Priority Date

4-277622

580N 1448

358/463; 358/460; 358/463;

3; 348/619; 348/701; 382/754

358/479; 403;

609; 107; 115; 134; 197; 453;

518; 619; 620; 607; 609; 700;

133; 143; 241; 364; 382/754;

804N 1440

See Cited

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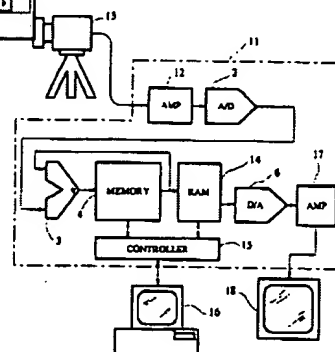
358/463

See et al. 348/619

**ABSTRACT**

A video processing apparatus uses multiple image signal integration and reduction for decreasing noise. A television camera picks up an image of a still object and outputs image signals repeatedly. An adder adds each newly captured signal to the sum of previously captured image signals stored in a memory and stores each new sum of image signals in the memory. A divider divides each new sum of image signals by the number of times the adder has performed additions, thereby providing a signal that is displayed on a monitor.

3 Claims, 3 Drawing Sheets



	U	1	Document ID	Issue Date	
5			US 5926570 A	19990720	Optical s
6			US 5777756 A	19980707	Video pro and redu

of a desired film sensitivity, depending upon whether the ASA sensitivity of the film is more than 100 to less than 400 or 400 or more, and depresses a shading start button to cause the projector lamp to light on at a reference light-on voltage  $V_{sub.1}$ . The cyan filter 223 serves to cut the color component of the orange base of a color negative film and adjust the color balance of a color sensor having R, G and B filters. Also, since shading data is obtained from the unexposed portion, a wide dynamic range can be obtained even in the case of color negative films. In the case of films other than color negative films, the operator sets a film carrier 215' having no filter or an ND filter for cutting infrared and ultraviolet rays into the projector and depresses a shading start key on the liquid crystal touch panel to cause the projector lamp 214 to light on at a reference light-on voltage  $V_{sub.2}$ . In practice, after the operator performs selection of negative film or positive film, switchover between the reference light-on voltages  $V_{sub.1}$  and  $V_{sub.2}$  may be automatically performed. Subsequently, the scanning unit moves to a central portion of an image projected area, and supplies to a RAM 78' shading data constituted by an averaged value of R, G and B equivalent to one or more lines of CCDs to put off the projector lamp.

Current US Cross Reference Classification - CCXR (1):

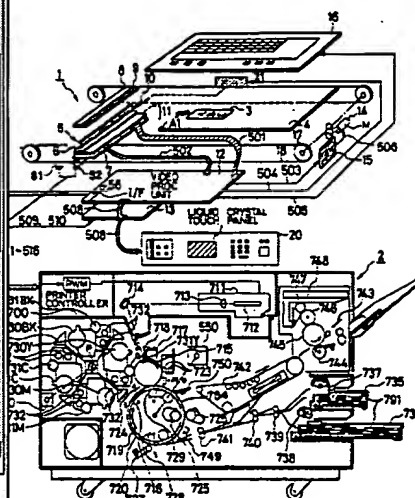
358/461

May 1, 1990

Sheet 1 of 59

4,922,335

FIG. 1



Details Text Image HTML KWIC

	U	1	Document ID	Issue Date	
7			US 6330345 B1	20011211	Automatic
8			US 4922335 A	19900501	Color film
9			US 5845017 A	19981201	Digital im- aging dist

## Brief Summary Text - BSTX (15):

The present invention is also intended for an image scan reader having the function of correcting the nonuniformity. According to the present invention, the image scan reader comprises (1) supporting means for supporting an original, (2) a white reference plate attached to the supporting means, (3) linear photosensor array means provided to face the supporting means, (4) means for relatively moving the supporting means and the linear photosensor array, (5) means for enabling the means (3) and (4) to detect distribution of optical densities on the white reference plate for M scanning lines, where M is an image integer satisfying the condition  $M=n+m$  and each of n and m is an integer larger than one, (6) means for averaging the distribution for n scanning lines within the M scanning lines to generate a first averaged data, (7) means for averaging the distribution for the other m scanning lines within the M scanning lines to generate a second averaged data, (8) comparing means for comparing the first and second averaged data with each other to select maximum value of the first and second averaged data for each position along a scanning line so that a set of maximum values are obtained, (9) means for generating a white reference data in accordance with the set of the maximum values, (10) means for enabling the means (3) and (4) to read an image of the original for each scanning line, to thereby generate an original image data, and (11) means for correcting the original image data in accordance with the white reference data.

s Patent (19)

(11) Patent Number: 5,062,144

(45) Date of Patent: Oct. 29, 1991

TAINING WHITE  
IA USED FOR  
IN-UNIFORMITY IN  
C CELL ARRAY

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Shin-Saiyama Mfg. Co. Ltd., Japan

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Primary Examiner—Leo H. Doodress  
Assistant Examiner—Robert Khanna  
Attorneys: Agent or Firm—Candlish, Fisher, Oertli & Seifert

## PRIORITY DATA

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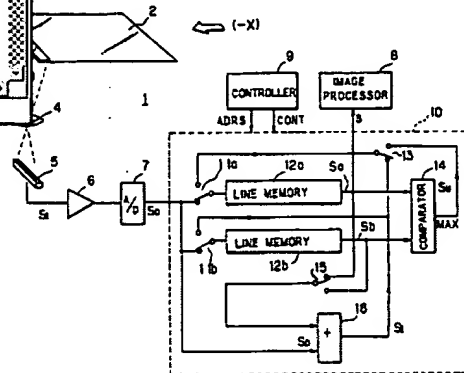
355/441, 444, 352/52,  
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355/441, 444, 352/52,  
352/53

## ABSTRACT

In an image scan reader, a white reference plate is attached to a transparent plate on which an original is to be placed. Different regions are defined on the reference plate and respective optical densities on a plurality of scanning lines ( $L_{11}$ ,  $L_{12}$ ,  $L_{13}$ ,  $L_{14}$ ,  $L_{21}$ ,  $L_{22}$ ,  $L_{23}$ ,  $L_{24}$ ) are detected and averaged within each region ( $R_{11}$ ,  $R_{12}$ ). The maximum averaged densities are selected for each given plate position to be used for correcting the non-uniformity of CCD cells which are employed in reading the white reference plate and the image of the original.

12 Claims, 3 Drawing Sheets



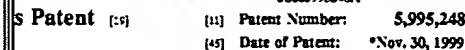
	U	1	Document ID	Issue Date	Method for chain
20			US 6707950 B1	20040316	Method for chain
21			US 5062144 A	19911029	Method of non-uniformity
22			US 5926570 A	19990720	Optical scan

**TITLE:** Image forming device and method having MTF correction

KWIC

The smoothing with smoothing filters is performed to reduce image noise by performing moving average with weighting addition on the image data of the periphery pixels of a central pixel, so that a smooth image can be reproduced.

Current US Cross Reference Classification - CCXR (12):  
382/274



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Primary Examiner—Christopher S. Kelley  
Assistant Examiner—Sheela Chawan  
Agency Agent or Firm—Sikley & Associates

## (57) ABSTRACT

1997

Publication Priority Data

4.1 \_\_\_\_\_ 8-0666-4

358/801; 358/801; 355/806

48: 358:455; 358:456; 358:530;

158/406 417

2, 471, 504, 507, 456, 298, 459.

332, 338, 339, 352, 357, 414

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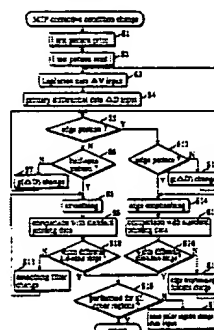
Se et al.	338,204
Frake et al.	257,204

Page 41 of 41

A test pattern comprising a half-tone pattern portion and an edge pattern portion printed according to standard printing data is read by a CCD sensor. A pattern discrimination device determines the positions of the half-tone pattern portion and the edge pattern portion. It is accordance with a prescribed edge detection criterion using the primary differential data CPU of density determined by primary differential filters, the APV of density is determined whether the image data corresponds to the half-tone density region or whether the image data corresponds to an edge portion. If the region discrimination result is different from the result of the pattern detection, the edge detection criteria are changed. The image data is then subjected to MIT correction, and conditions for smoothing or edge emphasizing are altered so that the difference between the corrected image data and the standard printing data remains within a allowable range.

16 Clatsco, 11 Degrading Shocks

	U	1	Document ID	Issue Date	
8			US 4811090 A	19890307	Image en- capability
9			US 5995248 A	19991130	Image for
10			US 5835614 A	19981110	Image pro



A.sub.i,j in a window size of W pixels by H scan lines are used by the second stage processing circuit 18 to compute the second stage average values B.sub.i,j for storage in the second stage average output 20. Preferably, as shown in FIG. 3, a running block 40 of the first stage average values A.sub.i,j is processed by the second stage processing circuit 18 to generate the second stage average values B.sub.i,j. The running block 40 essentially frames pixels at locations of the first stage average buffer 16 to provide a context having a width of W pixels and a height of H scan lines. It is to be appreciated that the first stage average values A.sub.i,j are retrieved from the buffer 16 by the second stage processing circuit 18 in a manner so that the running block "progresses" in the pixel direction along the scan lines or to the right as viewed in FIG. 3 by a single pixel column at a time. After the running block is "moved" to the rightmost edge of the first stage average values A.sub.i,j stored in the first stage average buffer 16, the block is shifted downwardly and to the extreme left. The running block essentially moves in a raster-like fashion repeatedly to retrieve video values from the next set of scan lines of the first stage average buffer 16.

Current US Cross Reference Classification - CCXR (2):  
382/274

	U	1	Document ID	Issue Date	Method a
17			US 5872867 A	19990216	Method a
18			US 6631215 B1	20031007	Method a correction
19			US 6574362 B1	20030603	Method a image

# et al. METHOD AND APPARATUS FOR IMPLEMENTING INTEGRATED CAVITY EFFECT CORRECTION IN SCANNERS

Inventors: Jeng-nan Shiao, Webster, NY (US);  
Raymond J. Clark, Webster, NY (US);  
Stuart A. Schweld, Piusford, NY (US);  
Terri A. Clingerman, Palmyra, NY (US)

Assignee: Xerox Corporation, Stamford, CT (US)

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Pub. No.: 09/448,009

Nov. 23, 1999

Class. G06K 9/40  
382/260; 358/3.27; 382/274;  
382/279  
Search 358/447, 3.27;  
382/274, 260, 275, 279, 309

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(10) Patent No.: US 6,631,215 B1  
(45) Date of Patent: Oct. 7, 2003

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Primary Examiner—Timothy M. Johnson  
(74) Attorney, Agent, or Firm—Fay, Sharpe, Fagan,  
Minnich & McKee, LLP

## (57) ABSTRACT

A method and apparatus are provided for determining a weighted average measured reflectance parameter  $R_m$  for pixels in an image for use in integrated cavity effect correction of the image. For each pixel of interest  $P_{i,j}$  in the image, an approximate spatial dependent average  $A_{i,j}$ ,  $B_{i,j}$  of video values in a region of W pixels by H scan lines surrounding the pixel of interest  $P_{i,j}$  is computed by convolving video values  $V_{i,j}$  of the image in the region with a uniform filter. For each pixel of interest  $P_{i,j}$ , a result of the convolving step is used as the reflectance parameter  $R_m$ . The apparatus includes a video buffer for storing the pixels of the original scanned image, and first and second stage average buffers for storing the computed approximate spatial dependent averages  $A_{i,j}$ ,  $B_{i,j}$ . First and second stage processing circuits respectively generate the first and second stage average values  $A_{i,j}$ ,  $B_{i,j}$  by convolving the video values of the image in a preselected region with a uniform filter.

17 Claims, 3 Drawing Sheets

